

## CLAIMS

## We claim:

- Sub  
A1*
1. An RF coupled implantable medical system comprising:  
a transmitting unit;  
a receiving unit including an implantable, electrically  
operated, medical device ;  
said transmitting unit including RF energy transmitting  
means, RF signal receiving means and first control means  
coupled to said RF energy transmitting means and to said RF  
10 signal receiving means for controlling the amount of RF energy  
transmitted to said receiving unit; and  
said receiving unit including RF energy receiving means,  
RF signal transmitting means, a rechargeable power supply  
coupled to said RF energy receiving means and second control  
15 means coupled to said rechargeable power supply means, to said  
RF energy receiving means, to said RF signal transmitting means  
and to said implanted medical device.
  2. The system of claim 1 wherein said receiving unit  
includes a titanium housing enclosing said RF energy receiving  
20 means, said RF signal transmitting means, said rechargeable  
power supply and said second control means.
  3. The system of claim 1 wherein said RF energy  
transmission means of said transmitting unit is constructed and  
arranged to transmit energy at a frequency between 10 Hz and  
25 500,000 Hz.
  4. The system of claim 1 wherein said rechargeable power  
supply has a temperature sensor which is mounted closely  
adjacent thereto and which is coupled to said control means in  
said receiving unit whereby the recharging of said rechargeable  
30 power supply can be controlled relative to the temperature of  
said rechargeable power supply thereby to prevent gas  
generation and loss of electrolyte by said rechargeable power  
supply.
  5. The system of claim 1 wherein said RF energy  
35 transmitting means of said transmitting unit is constructed and  
arranged to recharge said rechargeable power supply at a "fast"  
(high energy) rate or a "trickle" (low to medium energy) rate.
  6. The system of claim 1 wherein said transmitting unit  
includes mode selection means for setting said transmitting
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unit to operate in one of three modes, namely (1) "RF only", (2) "battery only" or (3) "combination".

7. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "RF only" mode, is operable to supply electrical energy to said implantable device through a rectifier directly to said implanted medical device, so long as said transmitting unit is located proximate to said receiving unit.

8. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "battery only" mode, is operable, periodically, to supply electrical energy to said implantable device from said rechargeable power supply for a period of at least 7 days.

9. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "combination" mode, is operable to supply electrical energy to said implantable device through a rectifier directly to said implanted medical device, so long as said transmitting unit is located proximate to said receiving unit, and, separately, to "trickle charge" said rechargeable power supply.

10. The system of claim 1 wherein said control means of said transmitting unit is constructed and arranged to control the level of RF energy transfer from the transmitting unit to the receiving unit relative to one or more of various parameters which include (a) proximity of said transmitting unit to said receiving unit, (b) the output voltage of said rechargeable power supply and (c) the temperature of said rechargeable power supply.

11. The system of claim 1 wherein said system is constructed and arranged so that said receiving unit, upon sensing a fully charged power source, will automatically terminate the transmission of RF energy by said transmitting unit, by telemetering a specific "stop" command to said transmitting unit.

12. The system of claim 1 wherein said transmitting unit includes a visual display coupled to said control means.

13. The system of claim 1 wherein said transmitting unit includes a keyboard coupled to said control means.

14. The system of claim 9 wherein said keyboard includes

keys to start and stop recharging the rechargeable power source within the implantable medical device.

15. The system of claim 1 wherein said implanted medical device is a tissue stimulator.

5 16. The system of claim 1 wherein said implanted medical device is a drug delivery system.

17. The system of claim 1 wherein said implanted medical device is a cardiac pacemaker system.

10 18. The system of claim 1 wherein said implanted medical device is a cardioverter/defibrillator.

*Sub A2* 19. The system of claim 1 wherein said transmitting unit has a self contained power supply, such as a battery, whereby said transmitting unit is portable and not dependant upon an a.c. power source.

15 20. The system of claim 19 wherein said self contained power source in said transmitting unit is rechargeable.

*add A<sup>3</sup>*